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Baroda - 390015, Gujarat State (IN)

(72) Inventor: Goradia, Amit

Baroda- 390 015-Gujarat State (IN)

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(74) Representative:

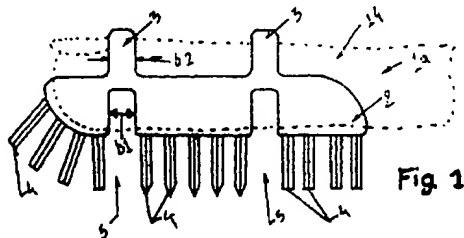
Pluckrose, Anthony William et al
BOULT WADE TENNANT,
27 Fumival Street
London EC4A 1PQ (GB)

(71) Applicant: Goradia Innovative Technologies PVT.
Limited

(54) A finger toothbrush

(57) A finger toothbrush (1a, 1b, 1c, 1d, 1e) has, with reference to Figure 1, a brush body (2) which exhibits a finger-supporting side and at least one generally loop-like holding element (3) for joining the finger toothbrush (1) to a finger (14). The brush body (2) bears bristles (4) and/or bundles of bristles on the outer surface facing away from the finger-supporting side. The brush body (2) additionally has at least one aperture (5) therethrough. A generally loop-like holding element (3) engages with at least one of the opposed boundary edges (6) of an

aperture (5) which extend along the finger toothbrush (1).



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Description

The invention relates to a finger toothbrush, having a brush body which exhibits a finger-supporting side and a generally loop-like holding element for joining the finger toothbrush to a finger, wherein the brush body bears bristles on an outer surface facing away from the finger-supporting side.

A finger toothbrush of this character is already known from US 1896941 by way of example. The disposable finger toothbrush in that reference comprises a thimble-like element. One face of the element is of cheesecloth and is used to engage the teeth of the user. The toothbrush has no bristles. The toothbrush is designed to be used once and then disposed. It is made from sheets of materials joined together. It comprises a compartment for the storage until use of toothpaste.

A further finger toothbrush bearing bristles in a portion of a tubular brush body is known from US 5 636 405. Such a finger toothbrush can be manufactured in one piece, for example in an injection mould with two mould halves. However, before injecting the mould part for forming the interior cavity of the tube, it is necessary that a core be introduced into the mould cavity formed by the mould halves and be withdrawn again after injection. This is likewise complex and costly with regard to the injection mould and manufacture.

The object underlying the present invention is to provide a finger toothbrush of the kind set forth at the outset, which can be manufactured quickly and to especial cost advantage in a particularly simple way.

The present invention provides a finger toothbrush having a brush body which exhibits a finger-supporting side for engaging one side of a finger of a user and at least one generally loop-like holding element which extends from the finger supporting side of the brush body to at least substantially encircle the finger of the user for joining the finger toothbrush to the finger, wherein:

the brush body bears bristles on an outer surface facing away from the finger-supporting side;

the brush body has an aperture extending therethrough from the surface of the finger supporting side which in use faces the finger of the user to the outer surface which faces away from the finger-supporting side;

the aperture is defined in part by a pair of opposed boundary edges of the aperture which extend lengthwise along the finger toothbrush; and

at least one of said boundary edges also forms an end edge of a holding element.

The aperture enables simple, one-piece manufacture of the finger toothbrush in an injection mould which may take the form of a multi-cavity mould for the simultaneous injection moulding of a plurality of finger toothbrushes, e.g. 24. Assembly of several components is not necessary. As a consequence, a high number of pieces of finger toothbrushes per unit of time can be manufactured, enabling cheap mass production.

A further advantage consists in that the aperture facilitates curvature of the brush body during cleaning for adaption to the dental structure. The flexibility of the finger toothbrush is thereby increased and cleaning efficiency can be enhanced.

The finger toothbrush of the invention can comprise a plurality of generally loop-like holding elements and a brush body which has a plurality of apertures extending therethrough from the surface of the finger supporting side which in use faces the finger of the user to the outer surface which faces away from the finger-supporting side, each aperture being defined in part by a respective pair of opposed boundary edges of the aperture which extend lengthwise along the finger toothbrush, each pair of opposed boundary edges also forming end edges of one of the plurality of holding elements.

It is advantageous if the width of each aperture along the finger toothbrush and the width of the holding element associated to said aperture are approximately equal. The portion recessed in the brush body for an aperture forms the loop-like holding element projecting at the finger-supporting side and spanning the aperture, which simplifies the manufacture of the finger toothbrush. The width of a loop-like holding element can be about 3mm to 10mm, preferably about 4mm. Good retention of the finger toothbrush on a finger is hence given and the holding element exhibits sufficient stability.

It is particularly suitable if the finger toothbrush consists of elastic material, particularly rubber or rubber-like plastic, polyethylene, polypropylene or similar plastic material usable in an injection moulding process. The brush body of the finger toothbrush is thereby elastic to an extent such that, during cleaning, it can be adapted particularly well to the dental structure by bending the finger. The bristles are hence likewise elastic, so that they do not cause any injury during cleaning, but on the other hand they exhibit sufficient stability for good cleaning efficiency. By means of the likewise elastic holding elements, good adaptation to different finger widths can be attained and, as a result of the elasticity, the holding elements rest snugly against the finger so as to prevent the finger toothbrush from becoming inadvertently detached from the finger. In addition, it is possible to provide slanting bristles. By virtue of their elasticity, such bristles can be ejected from the injection mould despite their slanting arrangement, as they can undergo elastic deformation accordingly during ejection.

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An advantageous embodiment contemplates that at least one of the holding elements is an arcuate, closed configuration arm. Particularly good and secure retention of the finger toothbrush on the finger is thus constituted.

Another embodiment contemplates that at least one of the holding elements has two arcuate holding arms whose free ends face each other and which can be spread apart against a restoring force. This renders it especially practicable to adapt the finger toothbrush to different finger widths. There is hence the possibility of producing finger toothbrushes in a single size, which can then be used in like manner by people with different finger widths. This simplifies manufacture significantly.

A particularly suitable embodiment contemplates that the surface of the finger-supporting side of the brush body which faces the finger of the user is dished, e.g. concave. The finger-supporting side is thus generally adapted in shape to the contour of a finger. The finger supporting side of the brush body in a region of an end receiving a tip of the finger is formed approximately up to or over the finger tip. With such an anatomical shape, the brush body can be held with especial convenience and ease, so that the handling of the finger toothbrush, or more specifically the cleaning of teeth, is simplified. Preferably each aperture in the brush body continues into a laterally arched edge area of the brush body. The laterally arched edge area provides additional lateral guidance for the finger, so that it rests particularly snugly against the brush body and the finger toothbrush is prevented from inadvertently slipping or sliding off. To prevent injury in the oral cavity, particularly by the finger nail of the finger holding the finger toothbrush at least in the region of the end receiving the finger tip, the dished brush body is formed approximately up to or over the finger tip. By this means the finger nail is peripherally enclosed by, and does not project beyond, the brush body. The finger nail, or more specifically its outer edge, is hence practically embedded in the dished brush body.

It is preferred that each aperture of the brush body continues into the laterally arched edge area so that the dished brush body can be bent more simply at the apertures in order that, during cleaning, the finger toothbrush be adapted to the dental structure by bending the finger.

The brush body preferably has a thickness in the range of 0.5mm to 3 mm. The wall thickness of the brush body is preferably 1.0mm.

It is advantageous if the bristles have a length in the range 3mm to 5mm. Preferably the bristles are 4mm long. In one embodiment bristles of different length are provided. The bristles are short enough to allow that the finger toothbrush, together with the finger holding it, be easily inserted into the oral cavity. On the other hand, the bristles are of a length sufficient to be able to give way elastically during cleaning, enhancing cleaning efficiency and preventing injury in the oral cavity. The cleaning action, particularly in the interdental spaces, can be further enhanced by bristles of different length, that is to say, by a contoured array of bristles.

Preferably at least some of the bristles each have a substantially round cross-section and a diameter in the range 0.05mm to 0.5mm. Preferably the bristles each have a diameter of 0.2mm. In one embodiment at least some of the bristles have a bristle tip with a portion of conical configuration, each conical portion tapering towards a free end thereof. Preferably the bristle tips have free ends which are rounded.

According to one embodiment, bristles can be provided whose cleaning ends are divided into a plurality of bristles tips. Fine, narrow bristles tips are thereby obtained, enabling thorough cleaning of the teeth and particularly of the dental interspaces.

It may be suitable if a peripheral rib generally bounding the array of bristles is provided and is of a height which is preferably about 0.5mm to about 1mm. If tooth powder is used, this is normally sprinkled onto the moistened finger toothbrush. The peripheral rib prevents the tooth powder from dropping off the finger toothbrush. The height of the peripheral rib is selected in such a way as, on the one hand, to keep the tooth powder on the finger toothbrush and, on the other, not to hamper cleaning.

In addition, it may be suitable if the brush body is provided with a pair of holding elements, a first holding element closest in use to the end of the finger of the user and a second holding element spaced apart from the first holding element by a distance which locates the second holding element at least further from the end of the finger of the user than the second finger joint. A plurality of holding elements produces improved retention of the finger toothbrush on the finger. Given two holding elements spaced as mentioned, the finger toothbrush can be designed in such a way the holding elements, and hence also the apertures, are in each case arranged in the region of a finger joint. By this means, the finger toothbrush can be adapted especially simply to the dental structure by bending the finger, so that in particular the molars can also be thoroughly cleaned.

Preferred embodiments of the finger toothbrush according to the present invention will now be described by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a longitudinal side view of a finger toothbrush according to a first embodiment of the present invention, having a dished brush body and two loop-like holding elements;

Fig. 2 is the finger toothbrush of Figure 1 viewed from the end at which the finger is inserted, with holding elements closed in a holding element which comprises an arcuate closed configuration arm;

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Fig. 3 is a finger toothbrush according to a second embodiment of the present invention viewed from the end at which the finger is inserted, with holding elements each having two arcuate holding arms;

Fig. 4 is the finger toothbrush of Figure 1 in which the end thereof receiving the finger tip is formed approximately up to the finger tip;

Fig. 5 is the finger toothbrush of Figure 4 viewed frontally from the end receiving the finger tip;

Figs. 6 to 8 illustrate various embodiments of bristles of a finger toothbrush according to the present invention; and

Fig. 9 is a schematic representation of an array of bristles of a finger toothbrush according to the present invention.

A finger toothbrush, altogether designated 1a, 1b, 1c, 1d, 1e in the respective Figures, has a brush body 2 and, projecting on the finger-supporting side of the brush body 2, two generally loop-like holding elements 3 for joining the finger toothbrush 1a, 1b, 1c, 1d, 1e to a finger 14 indicated by a dashed line in Figure 1. On the outer surface facing away from the finger-supporting side, the brush body 2 bears bristles 4 indicated in schematic form. Such finger toothbrushes 1a, 1b, 1c, 1d, 1e can be slipped onto a finger 14 and employed for cleaning teeth directly with the finger 14.

Figure 1 shows a finger toothbrush 1a whose brush body 2 has two apertures 5 therethrough. A loop-like holding element 3 engages with the opposed boundary edges 6 of each aperture 5 which extend along the finger toothbrush 1a.

In order that the finger toothbrush 1a can be manufactured in one piece and in an injection mould with only two plates, without further cores, in each case one aperture 5 and one holding element 3 are mutually opposed. During the injection moulding of the finger toothbrush 1a, one formation of a first mould cavity half engages with a respective recess of a second mould cavity half to form a holding element, whereby the formation is spaced at least in some regions from the recess. In the base area of the formation an aperture for this formation is produced during the injection moulding of the finger toothbrush, so that the injection mould can be opened again without any difficulty. When the injection mould is opened, simple ejection is possible because the finger toothbrush has no undercut areas. Separate cores and drawing devices are not necessary. The manufacture of the finger toothbrush is thus possible in a particularly simple, rapid and cost-advantageous fashion.

The apertures 5 furthermore enable simplified curvature of the brush body 2 when cleaning the teeth, since the apertures 5 also compose predetermined bending points.

It is also to be seen in Figure 1 that, on the one hand, the width b1 of an aperture 5 along the finger toothbrush 1a, and, on the other hand, the width b2 of the holding element 3 associated to said aperture, are approximately equal. On the basis of the above-described manufacture of the finger toothbrush 1a in an injection mould with two plates and a formation engaging with a recess to compose a holding element, the width b2 of a holding element 3 can be maximally as large as the width b1 of an aperture 5. Consequently, the holding elements 3 have the greatest possible width b2, permitting especially good retention of the finger toothbrush 1a on the finger. In addition, the holding element 3 are large and thereby sufficiently stable so as not to be damaged when inserting the finger or when cleaning teeth, increasing the service life of the finger toothbrush 1a.

The finger toothbrush 1a, 1b, 1c, 1d, 1e depicted in the Figures consists of elastic material, particularly rubber or rubber-like plastic, polyethylene, polypropylene or the like, which also lends itself well to use in an injection moulding process. Through the inherent elasticity of the material, the finger toothbrush 1a, 1b, 1c, 1d, 1e can easily be curved by the finger 14 holding them, so as to be able to adapt them to the dental structure and gain ready access to all oral areas. Cleaning efficiency can thereby be enhanced. In addition, the bristles 4 are also elastically yielding, preventing injury in the oral cavity during cleaning.

Figure 2 shows a finger toothbrush 1b viewed from the end at which the finger 14 is inserted. The holding element 3 to be seen in Figure 2 is an arm of arcuate, closed configuration. By this means, the finger toothbrush 1b is retained on a finger 14 especially well. Since the finger toothbrush 1b consists of elastic material, the holding element 3 can be stretched and thus adapt itself to different finger widths.

Figure 3 shows a different exemplary embodiment of a finger toothbrush 1c in which the depicted holding element 3 has two arcuate holding arms 7. The free ends of the holding arms 7 face each other. Since the finger toothbrush 1c consists of elastic material, the holding arms 7 can be spread apart against a restoring force. The holding element 3 can therefore adapt especially well and within broad limits to different finger sizes.

By this means it is not necessary to manufacture finger toothbrushes 1a, 1b, 1c, 1d, 1e of different size. If necessary, larger finger toothbrushes 1a, 1b, 1c, 1d, 1e with a larger brush body 2 can be provided for adults and smaller ones with a smaller brush body 2 can be provided for children. These can then be used by anyone in the respective group of persons, regardless of the individual finger size.

According to Figures 1 to 5 the brush body 2 is dish-shaped and its finger supporting side is generally adapted in shape to the contour of a finger. By this means, the finger 14 is held to the finger toothbrush 1a, 1b, 1c, 1d, 1e especially well,

preventing inadvertent detachment of the finger toothbrush 1a, 1b, 1c, 1d, 1e from the finger 14 during cleaning.

According to Figures 4 and 5, in the region of the end receiving the finger tip, the dished brush body 2 is formed approximately up to the finger tip. Figure 4 shows a side view of the end of a finger toothbrush 1d receiving the finger tip and Figure 5 shows a front view of a correspondingly configured finger toothbrush 1e. With these finger toothbrushes 1d, 1e, the finger nail does not project beyond the free edge 8 of the brush body 2, but is embedded in the brush body 2. Hence injuries in the oral cavity by the finger nail when cleaning teeth are prevented. The apertures 5 of the brush body 2 in each case continue into the laterally arched edge area (Figs. 1, 4). Simple curvature or bending of the brush body 2 in the region of the apertures 5 is thereby possible with little expenditure of force also with finger toothbrushes 1a, 1d having dished brush bodies 2.

The wall thickness d of the brush body 2 (Figure 2) is proportioned in such a way that the finger toothbrush 1a, 1b, 1c, 1d, 1e on the one hand exhibits sufficient stability to prevent damage of the brush body 2 in use, and on the other hand can be readily curved. In addition, the wall thickness d is selected in such a way as to obtain a short cooling time during injection moulding of the finger toothbrush 1a, 1b, 1c, 1d, 1e and thus higher manufacturing output of finger toothbrushes 1a, 1b, 1c, 1d, 1e per unit of time. The wall thickness of the brush body 2 is preferably about 0.5mm to 3mm, particularly about 1mm.

Figures 6 to 8 show bristles 4a, 4b, 4c varying in configuration. Figure 6 depicts two separate bristles 4a each tapering at one side toward its free end, thus enhancing the cleansing action of the bristles 4a. In addition, the free ends of the bristles 4a are rounded to prevent injury in the oral cavity when cleaning teeth.

Figure 7 shows a bristle 4b whose cleaning end is divided into a plurality of bristle tips 9. The bristle tips 9 are so narrow as to enable thorough cleaning of the teeth and particularly of the interdental spaces. The free extremities of the bristle ends 9 are also rounded to prevent injury.

Figure 8 shows a bristle 4c where the bristle tips 9 differ in length. The entire array of bristles 4c of a finger toothbrush 1a, 1b, 1c, 1d, 1e can thus be contoured to enhance the cleansing action. Furthermore, the bristle tips 9 are re-divided into fine end portions 11. An especially fine surface, with which the teeth can be cleaned especially thoroughly, is thus achieved.

Figure 9 shows a plan view looking onto the bristle side of a brush body 2, showing the apertures 5 from whose bordering edges 6 the holding elements 3 extend. Also indicated are several sections 12 of the array of bristles 4, each with one or more bristles (not shown). By suitably distributing the bristles 4 on the brush body 2, a contour can be provided, for instance with long bristles 4 in the outer area, with which especially good cleansing action can be achieved.

In Figure 2 a peripheral rib 13 is provided which extends along the longitudinal sides of the brush body 2 and bounds the array of bristles 4. The peripheral rib 13 prevents tooth powder sprinkled onto the bristles 4 from dropping off before the finger toothbrush 1b is introduced into the oral cavity. If necessary, the peripheral rib 13 could also be continued at the cross side of the brush body 2, so as to produce a peripheral rib 13 extending around the brush body 2.

According to Figures 1, 4 and 5, slanting bristles 4 are provided in the area of the front and longitudinal sides of the finger toothbrush 1a, 1d, 1e. Teeth can thereby be cleaned in a simpler and more thorough fashion.

Since the bristles 4 consist of elastic material, the slanting bristles 4 can also be detached from the mould without any difficulty after the finger toothbrush 1a, 1d, 1e has been injection moulded.

The finger toothbrushes 1a, 1b, 1c, 1d, 1e can be made in different sizes, e.g. larger ones for adults and smaller ones for children. Furthermore, finger toothbrushes 1a, 1b, 1c, 1d, 1e can be made with bristles 4 of different hardness. The finger toothbrushes 1a, 1b, 1c, 1d, 1e can be fashioned in different colours to distinguish ones of different size and/or bristle hardness. In addition, it is conceivable to provide the brush body 2 with a number or similar marking for this purpose, for instance a projection or a depression.

Claims

1. A finger toothbrush (1a, 1b, 1c, 1d, 1e) having a brush body (2) which exhibits a finger-supporting side for engaging one side of a finger (14) of a user and at least one generally loop-like holding element (3) which extends from the finger-supporting side of the brush body to at least substantially encircle the finger of the user for joining the finger toothbrush to the finger, wherein:

the brush body bears bristles (4, 4a, 4b, 4c) on an outer surface facing away from the finger-supporting side;

characterised in that the brush body has an aperture (5) extending therethrough from the surface of the finger-supporting side which in use faces the finger of the user to the outer surface which faces away from the finger-supporting side;

the aperture is defined in part by a pair of opposed boundary edges (6) of the aperture which extend lengthwise along the finger toothbrush; and

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at least one of said boundary edges also forms an end edge of a holding element (3).

- 5 2. A finger toothbrush as claimed in claim 1 which comprises a plurality of generally loop-like holding elements (3) and wherein:
- the brush body comprises a plurality of apertures (5) extending therethrough from the surface of the finger-supporting side which in use faces the finger of the user to the outer surface which faces away from the finger-supporting side,
- 10 each aperture is defined in part by a respective pair of opposed boundary edges (6) of the aperture which extend lengthwise along the finger toothbrush;
- each pair of opposed boundary edges also form end edges of one of the plurality of holding elements (3).
- 15 3. A finger toothbrush as claimed in claim 1 or claim 2, characterised in that the width (b1) of each aperture along the finger toothbrush and the width (b2) of the holding element associated with the aperture are approximately equal.
- 20 4. A finger toothbrush as claimed in any one of claims 1 to 3, characterised in that the finger toothbrush consists of an elastic material.
5. A finger toothbrush as claimed in claim 4 characterised in that the finger toothbrush consists of a rubber material.
6. A finger toothbrush as claimed in claim 4 characterised in that the finger toothbrush consists of a rubber-like material.
- 25 7. A finger toothbrush as claimed in claim 4 characterised in that the finger toothbrush consists of polyethylene.
8. A finger toothbrush as claimed in claim 4 characterised in that the finger toothbrush consists of polypropylene.
- 30 9. A finger toothbrush as claimed in claim 4 characterised in that the finger toothbrush consists of a material which can be used in an injection moulding process.
10. A finger toothbrush as claimed in any one of claims 1 to 9 characterised in that at least one of the holding elements comprises an arcuate, closed configuration arm.
- 35 11. A finger toothbrush as claimed in any one of claims 1 to 9 characterised in that at least one of the holding elements has two arcuate holding arms (7) whose free ends face each other.
12. A finger toothbrush as claimed in claim 11, wherein the two arcuate holding arms are adapted to be spread apart against a restoring force.
- 40 13. A finger toothbrush as claimed in any one of claims 1 to 12 characterised in that the surface of the finger-supporting side of the brush body which faces the finger of the user is dished.
14. A finger toothbrush as claimed in claim 13, wherein the finger-supporting side of the brush body in a region of an end receiving a tip of the finger is formed approximately up to or over the finger tip.
- 45 15. A finger toothbrush as claimed in any one of claims 1 to 14 characterised in that each aperture in the brush body continues into a laterally arched edge area of the brush body.
- 50 16. A finger toothbrush as claimed in any one of claims 1 to 15 characterised in that the brush body has a wall thickness in the range of 0.5mm to 3mm.
17. A finger toothbrush as claimed in claim 16, wherein the wall thickness of the brush body is 1.0mm.
- 55 18. A finger toothbrush as claimed in any one of claims 1 to 17 characterised in that the bristles have a length in the range 3mm to 5mm.
19. A finger toothbrush as claimed in claim 18 which has bristles of different lengths.

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20. A finger toothbrush as claimed in claim 18, wherein the bristles are 4mm long.
- 5 21. A finger toothbrush as claimed in any one of claims 1 to 20 characterised in that at least some of the bristles each have a substantially round cross-section and a diameter in the range of 0.05mm to 0.5mm.
22. A finger toothbrush as claimed in claim 20, wherein the bristles each have a diameter of 0.2mm.
- 10 23. A finger toothbrush as claimed in any one of claims 1 to 21, characterised in that at least some of the bristles have a bristle tip (9) with a portion of conical configuration, each conical portion tapering toward a free end of the bristle tip.
24. A finger toothbrush as claimed in claim 23, wherein the bristle tips have free ends which are rounded.
- 15 25. A finger toothbrush as claimed in any one of claims 1 to 24 characterised in that bristles are provided which are each divided into a plurality of bristle tips.
26. A finger toothbrush as claimed in any one of claims 1 to 25, which has a peripheral rib (13) generally bounding the array of bristles, the peripheral rib having a height which is in the range 0.5mm to 1mm.
- 20 27. A finger toothbrush as claimed in any one of claims 1 to 26 characterised in that the brush body is provided with a pair of holding elements, a first holding element closest in use to the end of the finger of the user and a second holding element spaced apart from the first holding element by a distance which locates the second holding element at least further from the end of the finger of the user than the second finger joint.

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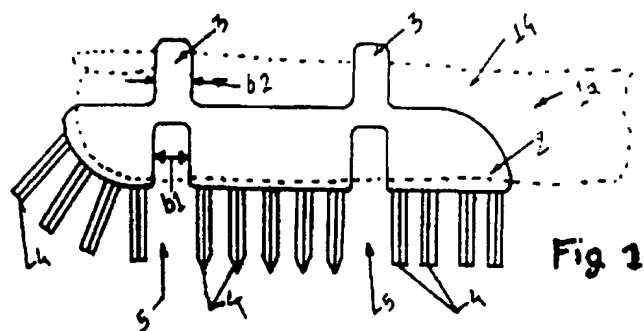


Fig. 1

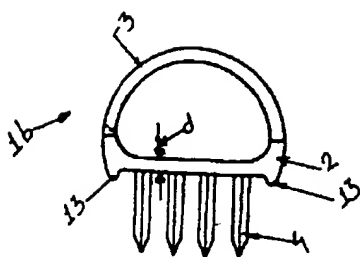


Fig. 2

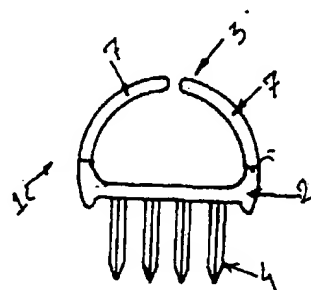


Fig. 3

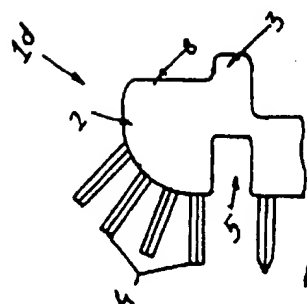


Fig. 4

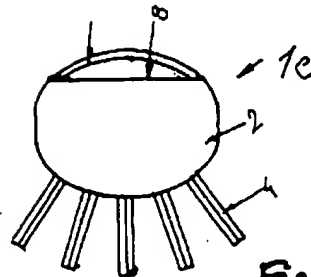


Fig. 5

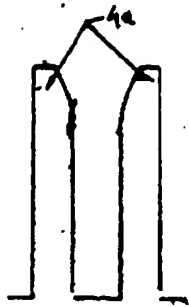


Fig. 6

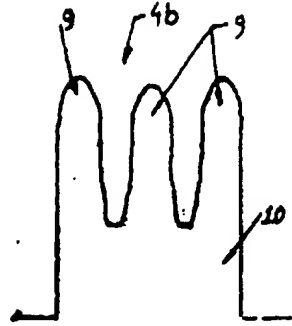


Fig. 7

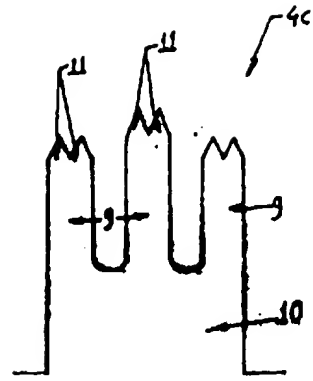


Fig. 8

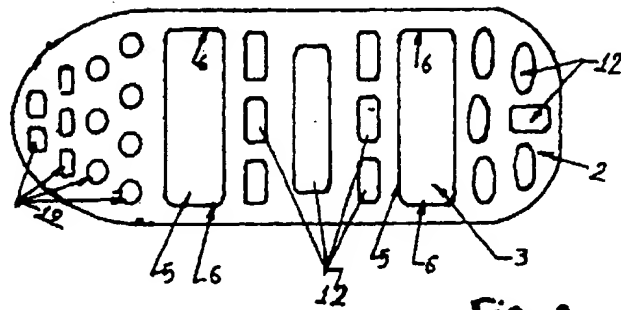


Fig. 9